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AUTHOR Morrison, Frances; Pawley, Catherine
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ABSTRACT

A study of the differences in achievement among Ottawa's grade 9 and 10 students taught in English and French in three subject areas (mathematics, geography, and history) in which suitable comparative measures were available had as subjects the students in 73 classes. The students in French-language classes were administered the test twice, once in English and once in French; half took the English test first, and half took the French test first. The instruments used were tests developed by the Carleton Board of Education. An attempt was made to correct for aptitude differences between groups and to examine item analysis data for group differences. Information concerning student use of French outside the classroom, difficulties related to a change in language of instruction, advantages of French-language instruction, and the subjects they preferred to be taught in French was also gathered from students and teachers. The test results suggest some differences in achievement between the subject matter areas, with the students taught mathematics in French performing better than in English, but those taught history and geography in French performing as well as those taught in English. Some problems were found with the marking system in which students have grades lowered for errors in French, i.e., in which language across the curriculum is emphasized. Limited opportunities to speak French were identified as an area for improvement, and both students and teachers mentioned limited student ability for both personal and technical expression as a problem. (MSE)

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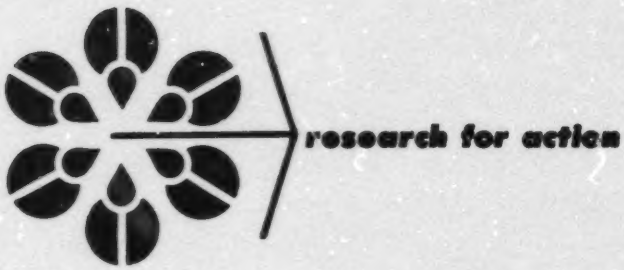

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SUBJECTS TAUGHT IN FRENCH:
Former immersion students in grades 9 and 10 of three Ottawa high schools

Frances Morrison
Catherine Pawley

Research Report 84-09

November 1984

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research centre / centre de recherches
The Ottawa Board of Education / Le Conseil scolaire d'Ottawa
Location: Lyon St. S., K1S 3Z2, tel. 563-2408 Mailing address: 330 Gilmour St., K2P 0P9

SUBJECTS TAUGHT IN FRENCH

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INTRODUCTION

General Background

Since immersion programs for the development of proficiency in French were introduced in the Ottawa area and in other parts of Canada, there has been concern about the appropriate subjects to be taught in French and about the possibility of poorer performance of students who are taught a subject in their second language. In most early-entry programs, starting in kindergarten and grade 1, instruction in nearly all subjects except English language arts has been carried out in French for the first four or five years of the program. In the later elementary grades the the choice of subjects to be taught in French sometimes depends on the background of the immersion teachers. In the case of mathematics the choice of the language of instruction seems to be more often made deliberately; this subject is taught in English in some schools and in French in others. There has been little or no evidence to date of any adverse effect on the achievement of students in the elementary grades. However, the question continues to be asked at the high school level.

The 1983 contract with the Ministry of Education included as one of two major topics of investigation an examination of the differences in achievement of students taught in English and in French in several subjects where suitable measures were available. An attempt was to be made to correct for aptitude differences between groups and to examine item analysis data for group differences, as well as to obtain information from teachers and students concerning matters related to the language of instruction.

Programs and Groups Studied

An examination of the subjects taught in French at the high school level and the size of the various groups of students being taught in French showed that in grades 9 and 10 there were sizeable groups who were taking mathematics, history and geography in French. Moreover, in these subject areas, objective tests already developed for use in the Carleton Board of Education could be made available for use in this study. These were based on recent Ontario Ministry guidelines and contained items drawn from the Ontario Assessment Instrument Pool (OAIP) and other sources.

The grade 9 groups included in the study consisted of all advanced level mathematics classes, whether taught in English or in French, in the three Ottawa bilingual high schools, and all advanced level geography classes in these schools and in one other where geography was being taught in French. At the grade 10 level the students tested consisted of those taking advanced level history in the four schools offering this subject in both English and French. The number of classes involved is shown in Table 1. Although the tests were also administered by the Carleton Board of Education in schools of that board, some of the data were not available in time for inclusion in this report and in other cases the numbers of students having test results were not large enough to form suitable analysis groups.

Table 1 also shows the number of students included in the groups whose results were analyzed for comparative purposes. In addition to the students who were absent on the day of testing, students were not included in the analysis of the classes taught in French or in English if they appeared to have come from a French-speaking family, to have

attended a school for francophones, or to have lived for some time in a French-speaking milieu. Others not included were those who were identified as students for whom English was a second language and whose command of English was poor. In the classes taught in French, students were also omitted from the analysis if they had neither a primary- nor a late-entry immersion background prior to grade 9. These decisions were based on information given by the students in a brief survey questionnaire which all students tested were asked to complete. Teachers were also asked to complete a questionnaire related to their students' attitudes and experiences. Differences between the number of cases indicated in Table 1 and in later tables occur because data were not available for some students on all of the tests involved in the study.

TABLE 1

NUMBER OF CLASSES AND STUDENTS INVOLVED IN STUDY OF SUBJECTS TAUGHT IN FRENCH, OTTAWA BOARD OF EDUCATION, GRADES 9 AND 10, SPRING 1983

Group	Grade 9 Mathematics	Grade 9 Geography	Grade 10 History
Course taken in French:			
Number of classes	6	11	10
No. of students in analysis group	101	172	162
Course taken in English:			
Number of classes	14	16	16
No. of students in analysis group	251	311	289

In the group of students who were taking mathematics in English it was possible to identify a subgroup (not shown in Table 1) of about 45 students who had taken the subject in French for at least the previous

two years but in whose school mathematics was not offered in French at the grade 9 level. Results for these students were analyzed separately.

In all groups being taught history, geography or mathematics in French, all students took the tests involved twice. At the first administration, half of the class took the test first in French while the other half took it in English. This was reversed for the second administration.

Instruments

Mathematics. The test used for grade 9 (advanced) mathematics students was based on one developed for use in the Carleton Board of Education in 1981-82. That test was submitted to the Ottawa Board mathematics consultant and to the mathematics teachers whose classes would be involved in the study to determine whether the items were suited to the curriculum of that board. The test, originally consisting of 80 items, was reduced to 50 items so that it would be better suited for administration within one class period. In addition, slight modifications were made to a few of the items. The topics covered by the various items included numerical methods, geometry and algebra.

Geography. The geography tests used with grade 9 (advanced) geography students in the spring of 1983 were selected from a set of six parallel tests developed in 1982 for use in the Carleton Board of Education. The Ontario Ministry of Education objectives provided a basis for the selection of test items which were examined for appropriateness to the Carleton Board curriculum. Many of the items were drawn

from the Ontario Assessment Instrument Pool (OAIP), although other sources were also used to some extent. Both content and skill objectives were measured with items at high and low cognitive levels.

The geography tests, which were available in both English and French, were submitted to the Ottawa Board geography consultant to determine which were preferred for administration in that board. It was decided that the classes taking geography in French should take different forms of the test in French and in English and the classes taking geography in English should all take the same English test. Each of the two tests chosen consisted of 41 items with similar content; they also had similar mean scores, standard deviations and test reliability, based on testing about 400 students in the Carleton Board in the previous spring.

History. The instrument selected for administration to grade 10 (advanced) level history students had been prepared for an intermediate history evaluation in the Carleton Board of Education following the Ontario Ministry of Education guidelines for history at this level. The original test had consisted of three separate 25-item parts, dealing with English-French relations, Government and Law in Canada and Canadian-American relations. The French version of the same test was administered to students taking grade 10 history in French.

Validity of instruments. As has already been mentioned, the content validity of the test in each subject was assessed by the consultant for that subject. It will be recalled that some modifications were made in the original mathematics test and that two parallel but different subtests were used in geography.

For each of the groups tested, class marks assigned by the teacher were obtained for the term ending in January. As further indication of the validity of the tests correlations between each of the tests and the corresponding school marks were obtained for each of the analysis groups. Table 2 gives results of these comparisons.

TABLE 2

RELATIONSHIP BETWEEN TEACHERS' MARKS AND ACHIEVEMENT TESTS IN THREE SUBJECTS TAKEN IN ENGLISH OR FRENCH, OTTAWA, SPRING 1983

Subject and grade	Language of test	Subject taken in English		Subject taken in French	
		r	N	r	N
Mathematics 9	English	0.67	219	0.67	102
Mathematics 9	French	--	-	0.69	106
Geography 9	English	0.53	270	0.44	199
Geography 9	French	--	-	0.49	179
History 10	English	0.52	267	0.44	163
History 10	French	--	-	0.43	160

Correlations could also be obtained between the English and French-language versions of the tests for the bilingual class groups, since they took each test in both languages, half with the English test first and the rest with the French test first. For the two groups which took the same test in both languages, the correlations of 0.89 for mathematics and 0.85 for history reflects a high level of equivalence. For geography, where different test items were used in French and in English, the lower correlation of 0.65 probably reflects the differences in specific content.

Measures of internal consistency (KR-20) ranged from 0.83 to 0.88 for the mathematics and history tests and from 0.76 to 0.78 for those used in geography.

Group Differences in Scholastic Ability

The Differential Aptitude Test is administered in the fall of the grade 9 year in Ottawa schools and scores on three subtests were available: Verbal Reasoning (VR), Numerical Ability (NA) and Abstract Reasoning (AR). The Henmon-Nelson Test of Mental Ability, Level 9-12 (HN) is also given in many schools, and these scores were also available.

Table 3 shows the results of the ability tests for the main analysis groups identified in terms of the language of instruction. It will be seen that for each of the four ability measures, the group taking a subject in French scored significantly higher than the group taking it in English. In the case of mathematics, the additional group who had taken mathematics in French in grades 6 to 8 but who were taking it in English in grade 9 tended to be similar in ability to the group of students currently taking mathematics in French. Using as the covariate the aptitude measure which seemed most suitable in each case (DAT Numerical Ability for mathematics and DAT Verbal Reasoning for history and geography) an analysis of covariance (ANCOVA) was carried out in each case in order to control the results statistically for differences in ability.

TABLE 3

RESULTS ON TESTS OF ABILITY FOR SUBJECT-MATTER ANALYSIS GROUPS, GRADES 9 AND 10, OTTAWA, SPRING 1983

Test	Mathematics Groups					
	Mathematics in English (no recent math in Fr.)			Mathematics in French		
	Mean	SD	N	Mean	SD	N
DAT: Verbal Reasoning	21.9	8.6	263	27.5*	8.3	111
Numerical Ability	22.1	6.0	266	23.8*	6.1	111
Abstract Reasoning	34.7	8.5	265	38.7*	5.1	111
Henmon-Nelson	55.2	10.5	230	62.5*	8.7	82

	Geography Groups					
	Geography in English			Geography in French		
	Mean	SD	N	Mean	SD	N
DAT: Verbal Reasoning	22.7	8.9	327	26.4***	8.3	179
Numerical Ability	22.3	6.3	331	24.2***	5.8	179
Abstract Reasoning	34.8	8.5	330	38.6***	5.8	180
Henmon-Nelson	55.1	10.2	205	61.5***	9.4	136

	History Groups					
	History in English			History in French		
	Mean	SD	N	Mean	SD	N
DAT: Verbal Reasoning	22.8	9.1	244	26.8***	8.8	163
Numerical Ability	22.8	6.4	244	24.1*	6.7	163
Abstract Reasoning	36.0	6.7	244	38.8***	5.0	163
Henmon-Nelson	55.8	10.3	121	60.8***	9.1	98

* Mean of this group significantly greater than that of the group taking the same subject in English ($p < 0.05$)

*** Mean of this group significantly greater than that of the group taking the same subject in English ($p < 0.001$).

TEST RESULTS: MATHEMATICS (GRADE 9)

Differences between Groups

In the spring of 1983 the mathematics test described earlier was administered both in English and in French to all grade 9 advanced level classes taking mathematics in French in the Ottawa Board of Education. The same test was administered in English to the classes taking the same mathematics course in English in the three Ottawa bilingual high schools. In one school, mathematics was not offered in French at grade 9. Therefore, for the purpose of studying this subject area, three analysis groups were formed:

(1) about 100 bilingual-program students taking mathematics in French

(2) about 45 students in the school which did not offer grade 9 mathematics in French who were taking mathematics in English after taking it in French in at least grades 7 and 8 (usually still bilingual-program students)

(3) about 230 students taking mathematics in English after not taking it in French at the grade 7 or 8 level (usually students enrolled in the regular English program).

The scores on the two mathematics measures, adjusted for differences in Numerical Ability, are shown in Table 4, along with the unadjusted scores for the same group of students for whom the adjusted scores were calculated. In addition, data for the second subgroup described above are included in the results shown in Table 4.

Even after adjustment for ability, the bilingual program group taking mathematics in French performed significantly better on the mathematics test taken either in French or in English than the group taking mathematics in English after no recent exposure to it in French. The adjusted mean score on the English-language test for the smaller

group taking mathematics in English after having had instruction in French in grades 7 and 8 was not significantly different from the mean scores of the two larger groups.

TABLE 4

MATHEMATICS RESULTS, ADJUSTED FOR DIFFERENCES IN NUMERICAL ABILITY, GRADE 9 ANALYSIS GROUPS, OTTAWA, SPRING 1983

Language of test	Type of mean	French instruction			Eng. instruction, recent Fr. math			English instruction		
		Mean	SD	N	Mean	SD	N	Mean	SD	N
English	Unadjusted	34.9*	8.4	97	32.1	6.8	44	28.7	8.2	231
	Adjusted	34.0*		97	31.9		44	29.4		231
French	Unadjusted	34.4*	8.1	101		na			na	
	Adjusted	33.9*		101		na			na	

* Mean of this group significantly greater than that of group taking math in English and having no recent experience of math in French ($p < 0.05$).

Order of Administration with Respect to Language

As noted earlier, the bilingual program group taking mathematics in French took the same test in both French and in English. Half the class took it in English first and the other half in French first; the language of testing was then reversed for the second administration. The results for each language were analyzed separately according to the order of administration to try to determine whether there was a difference in performance related to this order. These results are shown in Table 5. There were no significant differences between the results of the two administrations for the tests of either language.

TABLE 5

RESULTS ON GRADE 9 MATHEMATICS TEST,
BY LANGUAGE OF TEST AND ORDER OF ADMINISTRATION,
FRENCH INSTRUCTIONAL GROUP, OTTAWA, SPRING 1983

	Administered First			Administered Second		
	Mean	SD	N	Mean	SD	N
Test taken in English	33.2	8.5	58	35.6	7.9	51
Test taken in French	34.2	7.4	56	34.0	8.5	57

Results Analyzed by Sex

The results of all students who took the mathematics test in English and of the bilingual program students who also took it in French were analyzed by sex and the results adjusted for differences in Numerical Ability. These results are shown in Table 6. There were no significant differences between the adjusted mean scores of girls and boys on either the French or the English test. It had also been found that there were no significant differences between the sexes on any of the four ability measures, including Numerical Ability.

TABLE 6

GRADE 9 MATHEMATICS TEST RESULTS ANALYZED BY SEX,
OTTAWA, SPRING 1983

	Test taken in English			Test taken in French		
	Adj. Mean	SD	N	Adj. Mean	SD	N
Girls	30.9	8.9	212	34.8	8.7	57
Boys	31.4	8.0	164	33.5	7.7	44

TEST RESULTS: GEOGRAPHY (GRADE 9)

Differences between Groups

The English-language geography test described earlier was administered to all grade 9 advanced level classes taking geography in French in the Ottawa Board and to the classes taking the same course in English in those schools. It should be remembered that the French instruction group took a different version of the test in French. The French instruction group included some students at one school taking only geography in French, as well as bilingual-program students in three schools. Table 7 shows the unadjusted and adjusted mean scores for those groups of students who had scores on both geography and ability tests, using the Verbal Reasoning subtest of the DAT as the covariate in controlling for differences in ability.

TABLE 7

GEOGRAPHY RESULTS, ADJUSTED FOR DIFFERENCES IN VERBAL REASONING ABILITY, GRADE 9 FRENCH AND ENGLISH INSTRUCTIONAL GROUPS, OTTAWA, SPRING 1983

Test and language of test	Type of mean	French instruction			English instruction		
		Mean	SD	N	Mean	SD	N
Geography (Eng)	Unadjusted	25.0*	5.1	169	24.5	5.6	291
	Adjusted	24.4*		169	25.2*		291
Geography (Fr)	Unadjusted	23.4	5.9	168	--	-	-
	Adjusted	22.8		168	--	-	-

* Mean of this group significantly greater than that of the French instruction group on the French form of the test ($p < 0.05$).

The students in the French instructional group obtained a significantly higher mean score on the test taken in English compared to the mean score of the same students on the French version. On the geography test taken in English there were no significant differences in mean scores between the French and English instructional groups either before or after adjustment for ability.

Order of Administration with Respect to Language

The group taking geography in French took the same test in English as the English instructional group, as well as a different version of the test in French. As described earlier, half the class took the test first in English, while the other half took it in French; the language of testing was reversed for the second administration. The results for each language were analyzed separately according to the order of administration to determine whether there was any difference in performance related to this order. These results are given in Table 8. There were no significant differences either in French or in English between the results of the first administration and the second one ($p < 0.05$).

TABLE 8

RESULTS ON GRADE 9 GEOGRAPHY TEST,
BY LANGUAGE OF TEST AND ORDER OF ADMINISTRATION,
FRENCH INSTRUCTIONAL GROUP, OTTAWA, SPRING 1983

	Administered first			Administered second		
	Mean	SD	N	Mean	SD	N
Test taken in English	24.7	5.2	104	24.3	5.0	98
Test taken in French	22.4	5.1	93	23.0	6.6	99

Results Analyzed by Sex

The results for all students who took the geography test in English or in French were analyzed by sex and the results, adjusted for Verbal Reasoning, are shown in Table 9. Although there was no significant difference between the sexes on the adjusted means on the French version of the test, on the English one the boys had a significantly higher adjusted mean than the girls. The only significant difference between the sexes on the four ability measures was on the DAT Numerical Ability subtest, on which the mean for the boys taking the test in English was higher than that for the girls in the same group ($p < 0.05$).

TABLE 9

GRADE 9 GEOGRAPHY TEST RESULTS ANALYZED BY SEX, OTTAWA, SPRING 1983

	Test taken in English			Test taken in French		
	Adj. Mean	SD	N	Adj. Mean	SD	N
Girls	23.5	5.3	253	23.1	6.0	101
Boys	26.0***	5.4	207	23.8	5.7	67

*** Mean of this group significantly greater than that of the girls on the same test ($p < 0.001$).

TEST RESULTS: HISTORY (GRADE 10)

Differences between Groups

For history, the third subject area considered in the spring of 1983, the same version of the history test was administered in French and in English to all grade 10 advanced level history classes taking history in French in the Ottawa Board. The French instruction group included some students at one school taking only history in French, as well as bilingual-program students at three schools. The English version of the test was given to students taking the same course in English in these four schools. The adjusted history results are shown in Table 10, along with the unadjusted scores for the same groups of students. The DAT Verbal Reasoning scores were again used in the analysis of covariance.

TABLE 10

HISTORY RESULTS, ADJUSTED FOR DIFFERENCES IN VERBAL REASONING ABILITY, GRADE 10 FRENCH AND ENGLISH INSTRUCTIONAL GROUPS, OTTAWA, SPRING 1983

Measure	French Instruction			English Instruction		
	Mean	SD	N	Mean	SD	N
English History:						
Unadjusted	51.9*	8.0	156	50.5	8.4	242
Adjusted	50.8*		156	52.0*		242
French History:						
Unadjusted	49.1	9.6	152	--	-	-
Adjusted	48.0		152	--	-	-

* Mean of this group significantly greater than that of the French instruction group on the test taken in French ($p < 0.05$).

For the group of students taking the course in French the mean on the English version of the test was significantly greater than that for the same students on the French version ($p < 0.05$). After the results were adjusted for differences in verbal reasoning ability, the mean score of the English instruction group on the English version of the test was also greater than that of the French instruction group on the French version ($p < 0.05$). However, there were no significant differences between the English and French instruction groups on the English version of the test.

Order of Administration with Respect to Language

As noted earlier, the French instruction group took the test both in English and in French, with half the class writing it first in English and the other half in French; this was reversed for the second administration. Table 11 shows that, although there was no significant difference in the English test scores between the two administrations, the group which took the test in French after they had already taken it in English performed significantly better than the group which took it in French first.

TABLE 11

RESULTS ON GRADE 10 HISTORY TEST,
BY LANGUAGE OF TEST AND ORDER OF ADMINISTRATION,
FRENCH INSTRUCTIONAL GROUP, OTTAWA, SPRING 1983

	Administered first			Administered second		
	Mean	SD	N	Mean	SD	N
Test taken in English	52.3	8.1	82	51.3	8.9	95
Test taken in French	47.2	9.7	93	51.5**	9.1	82

** Mean of this group significantly greater than that of the group which took the test in French before taking it in English ($p < 0.01$).

Results Analyzed by Sex

The results on both the English and the French versions of the test were analyzed by sex and adjusted for differences in Verbal Reasoning. Table 12 shows that on the test taken in English the boys scored significantly higher than the girls. It had been found that on each of the four ability measures the mean score of the boys was higher than that of the girls, although these differences only reached significance for Numerical Abilty ($p < 0.05$).

TABLE 12

GRADE 10 HISTORY TEST RESULTS ANALYZED BY SEX,
OTTAWA, SPRING 1983

	Test taken in English			Test taken in French		
	Mean	SD	N	Mean	SD	N
Girls	50.0	7.7	207	48.0	9.4	80
Boys	52.3***	8.7	190	50.2	9.8	71

*** Mean of this group significantly greater than that of the group of girls on the test taken in the same language ($p < 0.001$).

Opinions of Students and Teachers

When the students taking a subject in French were asked what opportunities to learn French outside of school they had experienced, more spoke of bilingual exchanges than anything else. From 25 to 40 per cent of each group had participated in at least one such exchange.

The bilingual program groups taking mathematics in either English or French appeared to feel better prepared to continue in that subject than did the regular program group taking it in English. However, there were also significant differences between these groups in both numerical aptitude and fall mathematics achievement scores. In geography and history, on the other hand, the differences between the analysis groups for the two languages were not significant. About 90 per cent of each group felt themselves to be at least adequately prepared in history and geography. Only about a tenth of the French analysis group in mathematics thought they would have been better prepared if they had taken it in English, but for geography and history the proportion who felt this way represented about a quarter of the groups.

In each subject, various proportions of each group reported that they had at some time experienced a change in the language of instruction of that particular subject. From a quarter to a half of these students reported that they had had some difficulties related to the change in language, but in most cases this seemed to be a short-lived problem with new vocabulary.

The advantages in taking a particular subject in French most frequently mentioned by the students related to the improvement of French

proficiency through increased exposure to the language. For geography and history the development of oral proficiency was often specified. In both mathematics and geography, the main disadvantage to taking the subject in French was felt to be the difficulty in talking about the subject in English because of lack of knowledge of appropriate terminology, although many also spoke of difficulties with French. The history students tended to emphasize difficulty with the language more than terminology.

When asked which subjects they thought were suited to being taught in French, students appeared to respond on the basis of their own experiences rather than from the point of view of linguistic benefit and mentioned mathematics most frequently. The teachers seemed to favour the social science subjects because of their greater linguistic content.

Most teachers tended to point out the greater value of history and geography as a means of developing facility in the use of the French language. Students, on the other hand, often spoke of mathematics being easier to take in French because of the more limited vocabulary needed. They also mentioned frequently specific difficulty with technical vocabulary which they had met in one language and not the other. Most teachers appeared to feel that the courses in the two languages were equivalent, but some students seemed to perceive differences in emphasis, particularly in history.

Effects of Language of Instruction

This preliminary study of subjects taught in French in the early high school grades to students who had been in immersion classes at the

elementary level seems to identify certain differences between the subject matter areas. The test results did not seem to indicate any detrimental effect in mathematics of having taken the subject in French. The students in the French instructional group tended to have higher scores than the group instructed in English, even after adjustment for differences in aptitude. The students taught in French also did equally well on the test, whether it was given in English or in French.

In history and geography the situation was different. There tended to be no difference between the mean scores on the English-language test of the groups instructed in different languages, after adjustment for ability. In addition, the group taught history in French did significantly better on the English test than on the equivalent French version. They also had higher scores on the French-language test when they had taken the English version first. For the group taking history in French, there were 15 items on which the proportion of the students answering the English item correctly was significantly higher than the proportion answering the French item correctly, and only two cases of a significant difference in the opposite direction.

Similar results were obtained in geography, but the comparisons which could be made were limited because the specific content of the tests in the two languages were not the same. Reading comprehension in French may have been a limiting factor in the test performance of students of history and geography, who may not have understood some of the expressions used in French-language items well enough to answer them accurately.

Marking Procedures

In history and geography many teachers appeared to use the practice of deducting marks for errors in French from the total mark awarded on a test or assignment. This procedure was perceived by students as making it inevitable that their marks in these subjects taken in French would be lower than the marks they would have received if they had taken the subject in English. It does not seem to have been common for teachers to use a marking system which distinguishes clearly between marks given for subject-matter knowledge and marks for language usage. The same problem occurs in the teaching of a subject in the student's first language when attempts are made to emphasize "language across the curriculum".

Opportunities to Speak French

Both students and teachers were aware of the limited opportunities to speak French in high school classes in history, geography and mathematics. Both also mentioned the difficulties that many students had in expressing themselves in French, and particularly in communicating their opinions and feelings. The students, more than the teachers, also mentioned their difficulties with specific technical vocabulary, particularly in geography and mathematics, and their feeling of insecurity when they did not know the English terms for concepts learned in French.

Concluding Statement

Although this study of subjects taught in French did not provide evidence that students had major difficulties in learning various subjects in what is for them a second language, it did show that there were some areas which may need more specific attention. For example, perhaps more effort could be made to be sure that students are able to use technical vocabulary in both languages, since so many of them seem to feel that this is a real handicap. Those teachers who teach a subject in French may need to continue through high school to make a strong effort to help students with difficulties in comprehension, both in listening and in reading, and to provide opportunities for oral communication more systematically than is necessary when instruction is given in the first language. Attention could also be given to the development of marking procedures appropriate for the dual purpose of these courses, language development and subject matter knowledge, and perhaps to the provision of more opportunities for language input from a variety of sources - films, visiting speakers, additional sources of reading material, etc. Such changes should add to the already considerable achievements of the bilingual programs in the Ottawa-Carleton area and elsewhere.